Space Weather Forecast

Issued on Tuesday 5 November 2024 at 13:29 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity with further Moderate flares expected, and a slight chance of Strong flares. Chance of G1/Minor Storms on 06/07 Oct.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has increased to High levels due to occasional Moderate-class flare activity. The largest flare was at at 04/1538 UTC from a moderately sized region in the southeast. There are twelve active sunspot regions visible on the solar disc. The two most actively flaring regions on the disc, in the southeast, both underwent some slow growth and have moderate magnetic complexity. A previously active flaring region in the northwest continued to decay. The remaining spots on the disc are comparatively smaller or less magnetically complex. New minor spots emerged in the southeast and northwest disc, meanwhile at least one region rotated off the facing-disc.

A Coronal mass Ejection (CME) that left the Sun on 04 Nov following the Moderate flare of a region in the southeast is awaiting additional modelling to determine if there is an Earth-directed component, although the bulk of the ejecta appears to be directed behind Earth orbit.

Solar Wind / Geomagnetic Activity: Solar winds were at Slightly Elevated levels throughout, generally between 420-470km/s owing to minor coronal hole influence. The Interplanetary Magnetic Field (IMF), Bt, was predominantly Weak, but increased to Moderate levels late in the period. The important north-south component, Bz, varied weakly, oscillating between positive and negative directions. Geomagnetic Activity was Quiet to Unsettled (Kp0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) fell to background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity is forecast to continue with occasional Moderate flares expected and a slight chance of isolated Strong flares. These most likely from the large region in the northwest, or the two moderately sized regions in the southeast disc.

Solar Wind / Geomagnetic Activity: Ongoing fast winds from one or more coronal holes is ongoing, albeit weakly, with the enhancement expected to continue until Day 2 (06 Nov). A further minor coronal hole enhancement is possible late Day 4 (08 Nov).

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A CME that left the Sun early on 04 Nov is being reanalysed, but may give Earth a glancing impact either on Day 2 or 3 (06 or 07 Nov) with low-moderate confidence.

Generally Quiet to Unsettled geomagnetic activity is forecast on Day 1 (05 Nov), with a chance of isolated Active intervals at first. Activity is then expected to decline to mainly Quiet levels through Day 2 (06 Nov) and Day 3 (07 Nov), potentially becoming Unsettled to Active with a chance of G1/Minor Storm intervals depending on any potential CME influence. On Day 4 (08 Nov) activity should be Quiet to Unsettled, but with a chance of isolated Active intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) has now declined to background levels, with only a slight chance of further enhancement above S1/Minor Storm levels.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	30	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	80	80
Very Active	R3-R5 (X Class)	No	15	15	15	15

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	10	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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